

# Study of the Effects of NO on Wheat Stripe Rust by ESR spin trapping

**Baolu Zhao<sup>1</sup>, Yuanlin Cao<sup>1</sup> and Yongchun Niu<sup>2</sup>**

<sup>1</sup>Institute of Biophysics, Academia Sinica. Beijing 100101, China

<sup>2</sup>Plant protective Institute, Chinese Academy of Agriculture Science, Beijing China

Wheat stripe rust, caused by *Puccinia striiformis* sp. *Tritici* west, is one of the most serious diseases of wheat throughout the world. Three isolates of the pathogen (CY31,72107 and Su-VIII) and two wheat cultivars (Reichersberg 42 and Selkirk) were used to investigate the effect of active nitrogen on spore germination and interaction of host-pathogen. In order to study the concentration of endogenous NO free radical and its role in the compatible and incompatible combinations of wheat, we developed a specific spin trapping technique for NO free radical in the plant. The results showed that nitric oxide compounds in the air increased the germination rate of spore in the range of 0.3-100mg/m<sup>3</sup>, decreased that over 100 Mg/M<sup>3</sup> and inhibited the germination completely in concentration of 300Mg/M<sup>3</sup> respectively. A characteristic ESR spectrum of NO free radical was detected in the leave of the plant and kept at a high level after inoculation till to 72hr. It was found that the concentration of NO generated in the incompatible combination was higher than that in the compatible and control during this period time and this difference reached to a maximum at 60 hr. After that the NO concentration in the plant decreased to a low level (72-168 hr) and then increased again during 168-216hr. The second peak in the compatible combination was earlier than that of incompatible and control. The severities of disease on the plant leave were corresponded to the change of NO concentration. This result suggests that NO plays a key role in the process of wheat stripe rust.